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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,596	08/20/2001	Henry Johnson	H0001719 (4960)	6853

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EXAMINER

DINH, TUAN T

ART UNIT PAPER NUMBER

2827

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/933,596

Applicant(s)

JOHNSON ET AL.

Examiner

Tuan T Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8 and 10 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 26 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities:

Claim 1, lines 5-6, and 10, please, change "the first and the second surface" to --the first and second surfaces--.

Claims 1, lines 9-10, please, change "the first and second sacrificial copper structure" to --the first and second sacrificial copper structures--

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubert et al. (U. S. Patent 6,291,779) in view of Watanabe et al. (U. S. Patent 5,319,159) or Bhatt et al. (U. S. Patent 5,487,218).

As to claims 1, 8, Lubert discloses an electronic device as shown in figures 1-11 comprising:

a dielectric substrate (3, column 5, lines 14-15) having first surface and second surfaces (21, 23, figure 1, column 5, lines 64-65), and a via (5, column 6, lines 11, 58) connecting the first and second surfaces, wherein the via has a horizontal cross

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sectional area (internal walls 9-see figures 3-11)substantially coplanar with the first or second surface;

a first and a second sacrificial copper structure (29, column 6, lines 22-26) deposited to the first and second surfaces (21, 23) and surrounding the via (5), respectively,

a via fill material (11, column 7, lines 15-20, column 8, line 9) which is a resin disposed within the via (see figures 4-11), on the first and second sacrificial copper structure, and at least partially on the first and second surfaces

wherein the first and second sacrificial copper structures (29) are formed on the substrate via a photolithographic process (column 8, lines 9-14).

Lubert does not disclose each of the structures covers an area of no more three times the horizontal cross sectional area of the via.

Watanabe shows a wiring board disclosed in figures 1i and 2 comprising: a copper foil (14) having a structure that covers an area of no more three times the horizontal cross sectional area of a via (8), and also, Bhatt shows a printed circuit board disclosed in figure 1 comprising a metal layer (5) having a structure that covers an area of no more three times the horizontal cross sectional area of the via.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make a copper structure that covers an area of no more three times the horizontal cross sectional area of the via as taught by Watanabe or Bhatt to employ the device of Lubert in order to provide a mechanical reduction of surface copper advantageously of the wiring board.

As to claim 2, Lubert discloses an electronic device as shown in figures 1-11 wherein the substrate comprises a wiring board (column 1, lines 5-8).

As to claim 3, Lubert discloses an electronic device as shown in figures 1-11 wherein the first and second surfaces (21, 23) of the dielectric material comprise a copper layer (first and second metallized surfaces).

As to claim 4, Lubert discloses an electronic device as shown in figures 1-11 wherein the via (12) has a via surface, and wherein the via surface (9) comprises copper.

As to claim 5, Lubert discloses an electronic device as shown in figures 1-11 wherein the copper of the via surface and the first and second sacrificial copper structure are formed in a single process (column 6, lines 11-62).

As to claim 10, Lubert discloses an electronic device as shown in figures 1-11 wherein each of the first and second sacrificial copper structures (29) covers an area of no more than two times the horizontal cross sectional area of the via.

Allowable Subject Matter

4. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6, 8, and 10 have been considered but are moot in view of the new ground(s) of rejection.

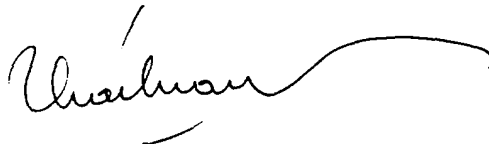
Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD
July 11, 2003.


Tuan Thai